

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
REGISTERED ENGINEER - CIVIL					<div>REGISTERED PROFESSIONAL ENGINEER No. _____ Exp. _____ CIVIL STATE OF CALIFORNIA</div>
PLANS APPROVAL DATE _____					

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

DISC SPRINGS AND WASHERS

"All dimensions in inches, except as noted"

L *	DISC SPRING					STEEL SPHERICAL WASHER			THICK WASHER		
	ID	OD	t	H	COLOR CODE	ID	OD	Nom thick.	ID	OD	t**
00.0 - 25.0	1.00	2.00	0.065	0.130	WHITE	1.19	2.25	0.50	1.03	2.00	0.25
25.1 - 31.9	1.00	2.00	0.084	0.136	RED	1.19	2.25	0.50	1.03	2.00	0.25
32.0 - 37.9	1.00	2.00	0.097	0.145	BLUE	1.19	2.25	0.50	1.03	2.00	0.25
38.0 - 45.0	1.25	2.50	0.120	0.180	YELLOW	1.31	2.50	0.50	1.16	2.00	0.25

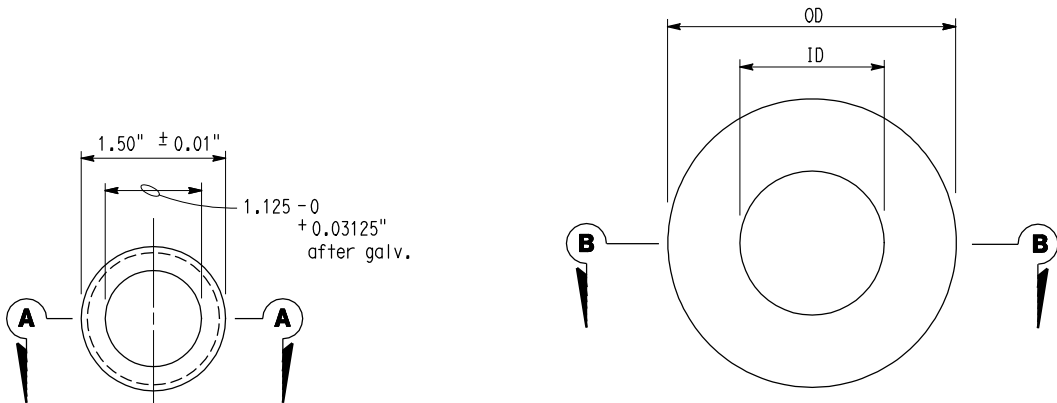
\* For limits of length L (ft), use effective length of cable, from face-to-face outer surfaces of anchorage plate or bearing bar. Refer to Bridge detail sheets for approximate length required.

\*\* Minimum value

Note: All OD and ID dimensions for washers and disc springs shall meet the dimensional tolerances for harden steel washers, ASTM F436

RESTRAINER UNIT INSTALLATION PROCEDURE

- 1a. For typical 'girder to opposite girder' or 'bent cap to girder' restrainers with one adjustment end:  
Place nut, washer and Thread Locking System on fixed end stud prior to tightening the cable.  
The adjustment end shall be at the same end of the cable for all restrainers at a specific hinge or bent.  
Install Cable Yield Indicator, spherical washers, disc springs, washers and nut on the adjustment end of restrainers as shown in "Cable End Anchorage Details". Discs shall be installed front to front as shown in "Disc Spring" detail.  
Tighten the nuts on the cable from the Adjustment End of restrainer until the disc springs collapse and there is no disc gap remaining between the discs.
- 1b. For typical "U" or "V" shaped restrainers units with two adjustment ends:  
Install Cable Yield Indicator, spherical washers, disc springs, washers and nuts on both adjustment ends of restrainer as shown in "Cable End Anchorage Details". Discs shall be installed front to front as shown in "Disc Spring" detail.  
The ends of the cable must be adjusted simultaneously.  
Tighten the nuts on the cable from the adjustment ends of restrainer until the disc springs collapse and there is no disc gap remaining between the discs on either end of the cable.
2. Place thread locking system on adjustment end(s) after tightening the cable but before backing off the nut(s).  
Back off the nut(s) at the adjustable anchorage(s) a distance equal to the maximum additional amount that the hinge is expected to open,relative to existing ambient conditions, as shown on the plans for movement rating.



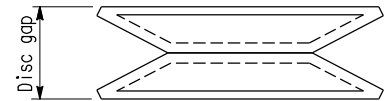
END VIEW

PLAN

SECTION A-A

SECTION B-B

( Single spring )



AS INSTALLED ON STUD

DISC SPRING

Note: For dimensions not shown, see table

"All dimensions are before galvanizing except as noted"

CABLE YIELD INDICATOR

STANDARD DRAWING					STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES	BRIDGE NO.	RESTRAINER UNIT - ADJUSTMENT END DETAILS												
RELEASE DATE 9/15/09	DESIGN	BY R.C. WHITTEN	CHECKED S. SAHS	APPROVAL RECOMMENDED BY <i>Paul C. Chung</i>			POST MILE													
FILE NO. xs7-710e-2	DETAILS	BY R.C. WHITTEN / D.RADLEY	CHECKED S. SAHS	DESIGN SUPERVISOR																
SUBMITTED BY P. CHUNG																				
STRUCTURES DESIGN STANDARD DRAWING SHEET (ENGLISH) (REV. 10/25/05)					ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	0 1 2 3	CU EA	DISCARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES ( PRELIMINARY STAGE ONLY )										SHEET	OF

Filename:xs7-710-2.dgn

DATE PLOTTED => 15-SEP-2009 TIME PLOTTED => 08:52